

11/23/04

Dear Mr. Johnson,

As discussed during our phone call, I am responding to you regarding the routing issues for the 345 kV line between the Lakefield and Split Rock substations. I am the transmission services engineer doing the technical analysis for Alliant Energy in this area.

Doug Collins forwarded your email from 10/13. I hope this document sufficiently addresses your questions. Below is a discussion of our concerns and various build options in general terms.

Alliant Energy recognizes the value of the considering of double circuit construction on part of this line due to reduced right-of-way needs. Double circuit construction of the 161 and new 345 kV lines on the same poles or towers must be analyzed with the possibility that a tower could fail. This will take out both lines which creates a NERC Category C type outage. This type of outage must be studied to ensure that cascading of the transmission system doesn't occur and that load can be served. We feel is Xcel's responsibility to do a thorough analysis of the transmission system to assess various build and construction scenarios. This has not yet been done.

While the Lakefield – Fox Lake 161 kV line project is different than the Lakefield – Split Rock 345 kV project, we still have double circuit construction concerns. Paragraph's A and B below make a comparison between the two projects to help give some perspective on the relative impact of the new line construction.

A) New Xcel Lakefield – Fox Lake 161 kV line:

As you recall, Alliant Energy's concern was the increased risk to its area load when the Lakefield – Fox Lake 161 kV line is out of service during construction should an outage on the Fox Lake – Winnebago line also occur. Alliant Energy pointed out that the risk could be reduced by running the power plant at Fox Lake to add support during the construction. This option added significantly to the cost.

B) New Xcel Lakefield – Split Rock 345 kV line:

Our primary concern with double circuiting again is having facilities out of service for extended periods of time during the construction process. The Alliant Energy system is designed to sustain the loss of any single facility (i.e. opening any of the 161 kV sections of line between Lakefield and Split Rock during construction). In the case of the 161kV system in question an additional outage on the system during a construction outage of the 161kV would put load at risk. For example, if the Split Rock – Magnolia 161 kV line is out of service to enable double circuit construction and the Lakefield – Heron Lake 161 kV line experiences an outage during that construction period, Alliant Energy load as well as other area loads would be at risk. Unfortunately in the case of the Split Rock – Lakefield 161kV line there are no effective generation resources that can pick up this load and therefore reduce the risk. There is a 19 MW generator at Worthington that can pick up some load, and some of

the load can be picked up from other sources on the underlying 69 kV system, but those adjustments are not sufficient to address the regional needs. This load is primarily Alliant Energy and Great River Energy customer load.

Another potential double circuit opportunity that has been mentioned is in conjunction with the Lakefield – Triboji 161kV line. There is additional load that would be at risk which is served from the Triboji substation if there is an outage for double circuit construction of the Lakefield – Triboji 161 kV and there is a simultaneous outage on the Triboji – Spencer 161 kV line. This is mostly Alliant Energy load, but also includes some Corn Belt Power, MidAmerican and Ameren load.

I have visited with a couple of the engineers at Xcel regarding this 345 kV project to find out what analysis they have done. Xcel did not look at load serving capability during construction, however, it is the major concern of both Alliant Energy and Great River Energy.

If the new Xcel 345 kV line is built completely on separate right-of-way so that there is no double circuiting with the 161 kV line at any point, then the following concerns are resolved.

- A) there are no load serving concerns during construction, and
- B) there are no double circuit outage concerns due to a tower failure during construction and after construction when the system is fully in-service.

This is the best case scenario from Alliant Energy's and Great River Energy's perspective.

Another way to reduce the risk is that if any portion of the 345 kV line is double circuited with the 161 kV, the line could be constructed while the 161kV line remains energized (an expensive proposition). Constructing a double circuit 345/161 kV line while Alliant Energy's 161 kV line remains energized will largely resolve our reliability concerns but does raise additional safety concerns.

One other possible way to mitigate outage risk during double circuit construction is to have Xcel build the line in such a way that the line section that is taken out of service can be put back into service within a 12 hr period of time if needed. This is likely to add costs to the project. I do not know if Xcel would view this as a practical way to build the line.

Aside from our load serving concerns discussed above the following are other important items that need to be mentioned:

- 1) Not all 161 kV line sections when out of service during construction present the same level of impact during construction. Some line sections have less of a load serving impact when out of service than other line sections. However, the great majority of Alliant Energy's concerns during construction of any double circuiting may be mitigated

by using the 345 kV as part of a temporary 161 kV loop(s) during construction. This option is briefly discussed later in this document.

Great River Energy should also be consulted on this as their Brewster substation will be impacted if double circuit construction takes place. They also have other load fed from Alliant Energy's 161 kV substations that are likely to be impacted by double circuit construction.

2) Alliant Energy could experience significant under-voltage in Iowa any time of the year on the underlying 69 kV system tied to the Triboji 161 kV substation if double circuiting a portion of the Lakefield – Triboji 161 kV line is done (de-energized) if an outage occurs on the Triboji – Spencer 161 kV line. Some load may have to be dropped in this event. However, using the 345 kV as part of a temporary 161 kV loop might also mitigate our concerns with double circuiting part of the Lakefield – Triboji 161 kV line. Alliant is looking into ways to resolve this system issue but will not likely have a solution in place before this 345 kV line routing and construction type decisions are made.

3) The Great River Energy Brewster 161 kV substation between the Heron Lake and Elk substations feeds a soy bean plant. It is my understanding that this is a 24/7 load that has no backup if power is lost on the 161 kV line. Any construction plan must take this need into account. I would suggest that Great River Energy be contacted to more fully understand any concerns they may have.

4) Firm transmission service already approved may be impacted by an extended outage of this 161kV line. MISO should be consulted to assess this and any other impacts that may exist where it relates to this project. They should be asked specifically if an extended outage could be approved.

5) You asked in your email Alliant Energy's feelings on sharing the cost of the 345 and 161 kV double circuit line. Alliant Energy does not feel that its customers should subsidize Xcel customers since the construction is not driven by Alliant Energy needs, but by the additional NSP generation. Also, the condition of our line doesn't require it to be rebuilt in the foreseeable future. If we did have plans in the near future to rebuild the 161 kV line, Alliant Energy may feel differently about sharing costs.

#### Possible build Option:

I have been in discussion with Xcel as to how to build the 345 kV line if double circuiting is required. While the ideas and build scenarios are not fully developed, I believe there is a way to do this while at the same largely mitigate Alliant Energy and Great River Energy's load serving concerns in the event of a contingency. It would involve tying the 345 kV line into various 161 kV substations between Lakefield and Magnolia and operate it as part of a looped 161 kV system during construction. Internal ballpark estimates are that it will add \$1.5 – \$2 million to the cost of the project. (It is worth noting that this expense would be avoided if there was no double circuit construction, and that double circuit construction is more expensive than building a single circuit line.) The

Worthington generation would not be needed if done properly. Such a build scenario would have to be in consultation with Great River Energy to ensure their Brewster substation concerns are properly addressed.

I realize this quick overview may be a bit confusing and generate still further questions. But it does indicate that we have been thinking about the “how to’s” of double circuit 345 and 161 kV lines. It may also give you an idea of the complexity involved in building double circuit.

The good news is that this type of building scenario should enable double circuit construction to go forward anytime of the year – as would building the 345 kV line without double circuiting it with the 161 kV line.

### Summary

I presented several possible build scenarios of the 345 kV line. There may be others that are variations of those discussed. From the Alliant Energy’s perspective I’ve listed them below in the order of most to least desirable.

- 1) Build the 345 kV line from Lakefield to Split Rock substations on a separate route without double circuiting on any existing 161 kV lines.
- 2) Build the 345 kV line from Lakefield to Split Rock substations as double circuit for whatever lengths seem appropriate, but do not de-energize the 161 kV line during construction.
- 3) Build the 345 kV line from Lakefield to Split Rock and double circuit some or most of the length of this with the 161 kV line. But use the 345 kV line as a 161 kV line to loop into Brewster and Elk Substations as necessary until construction is complete and then energize it to 345 kV after construction.
- 4) Build the 345 kV line double circuit with the 161 kV line over various portions of the line, but build in such a way that the section of line out of service for construction can be put back into service within 12 hours.

### 11/27 Addendum

Mr. Johnson,

In the email I sent you last week discussing our thoughts on the 345 kV line build project, I listed various build scenario. The last one, scenario 4) states "Build the 345 kV line double circuit with the 161 kV line over various portions of the line, but build in such a way that the section of line out of service for construction can be put back into service within 12 hours."

After reflecting on this over the weekend, I felt a need to clarify this option further. What I meant by this statement is that if one of Alliant Energy's line sections is out of service due to construction, and the next contingency would cause our customers to experience a power outage, then the line section out of service due to construction should be put back in service within a 12 hour time frame. I don't want to leave the impression that we are

willing to have our customers experience a 12 hour outage before a section of Alliant Energy's line that is out of service due to construction is put back into service.

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